

## APPENDIX G

Input: A continuous variable  $x$  of dimension  $m \times 1$  (note:  $x$  cannot be a constant variable).

Output: The binned  $x$ ,  $bx$ , of dimension  $m \times 1$

Process:

$k$  is the number of bins

If  $m < 1000$

$k = 5$

Else If  $m \leq 10000$

$k = \text{ceil}(5 + 5 * (m - 1000)/9000)$

Else If  $m \leq 100000$

$k = \text{ceil}(10 + 10 * (m - 10000)/90000)$

Else

$k = 20$

End If

$\text{maxv} = \max(x)$  // the maximum value of  $x$

$\text{minv} = \min(x)$  // the minimum value of  $x$

$\text{range} = \text{maxv} - \text{minv}$

$bx = \text{zeros}(m,1)$  // initialize a vector of dimension  $m \times 1$  to zeros

If  $\text{range} > 0$

For  $i = 1:m$

$bx(i) = \text{ceil}(k * (x(i) - \text{minv})/\text{range})$

If  $bx(i) < 1$

$bx(i) = 1$

End If

If  $bx(i) > k$

$bx(i) = k$

End If

End For

End If

Return  $bx$ .